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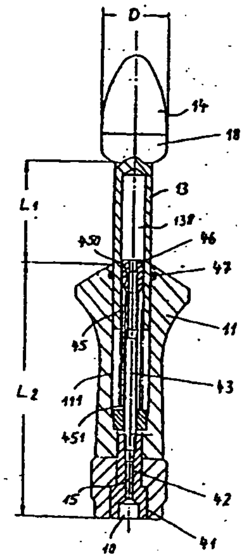
ELECTROSTIMULATION PROBE

Inventor:	Jürgen W. Steindorf 2875 Ganderkesee, DE
Applicant:	Susanne Ruth Steindorf 2875 Ganderkesee, DE
Agent:	D. Ninnemann Patent Attorney 1000 Berlin

Electrostimulation probe to treat bladder or anal incontinence as well as hemorrhoids, with rod electrode 13 that can be inserted into the anal canal of a patient, a part that limits the depth of penetration and rests against the external sphincter area, as well as shaft 13 for handling the probe, whereby rod electrode 13 is designed at least in part as an electrode that can conduct electricity. The length L_1 of rod electrode 13 is variable and preferably has clamp device 41-46 to stop the adjusted length of the rod electrode.



The invention relates to an electrostimulation probe of the type specified in the generic part of Claim 1.

From DE-OS 35 18 317, an electrostimulation probe according to Figure 1 is known that can be inserted into the sphincter area 2 of the rectum 3 of a patient. The known stimulation probe has a rod-shaped part 13 that can be inserted into the sphincter area of the patient, the front face of which is designed as an olive or egg-shaped head and whose other end is adjacent to a plate-shaped part 12 that lies against the perineum of the patient in the inserted state of the electrostimulation probe. Shaft 11 serves for handling of the electrostimulation probe, and an electrical line, connected to an impulse generator that is not represented in detail, can be plugged into its front face.

The known stimulation probe can be designed arbitrarily as a monopolar, bipolar, or multipolar electrode in that different areas of the egg-shaped head, the rod, and the plate-shaped part are provided with an electrically conductive coating, whereby electrically insulated parts are provided between the electrically conductive coatings to form a bipolar or multipolar electrode. Corresponding to the number of the electrodes formed on the stimulation probe, electrical lines lead from the electrodes to the front face of the shaft where they are connected via a plug connection with one of the number of electrical lines, corresponding to the number of electrodes, that run to an impulse generator.

In the development of the known stimulation probe as a monopolar electrode, a suitable surface electrode is also attached in the back or pelvic area of the patient as a counterelectrode and, like the stimulation probe, is connected to the impulse generator.

The external form of the known electrode ensures a secure lodging in the sphincter area of the patient and enables extremely intensive but also careful treatment of the patient when designed as a monopolar electrode, due to the large area serving for the discharge of the

stimulation current impulse. In particular in cases of severe incontinence and insufficiency, as well as for the treatment of hemorrhoids, the known stimulator designed as a monopolar electrode proves extremely expedient because, due to the large area of application, even the most far-removed muscle areas are stimulated or, in the case of particularly sensitive patients, impulses of lower amplitude can be used with maximum efficacy.

In cases of mild incontinence or for less sensitive patients, however, it is possible to eliminate such an intensive but careful treatment because it is desirable to achieve treatment success by means of coatings with lower electrical conductivity relative to that of the known electrode. In such cases, the stimulator can be formed as a bipolar or multipolar electrode whereby, due to the smaller electrode surface, the stimulation current density will necessarily be greater whereas, however, the application of a surface electrode as counterelectrode can be spared.

From US-PS 37 49 100, a bipolar electrode for electrical stimulation of the anal sphincter of a patient suffering from incontinence is known that has a spherical electrode head, a gradually narrowing electrode neck, and a broadened electrode end.

In the area of the tapering electrode neck, two electrodes are provided that are attached longitudinally on opposites sides, and that, compared to the total surface of the electrode neck, have a small surface, and to which electrical impulses can be applied which cause a contraction of the anal sphincter. The impulses are designed to cause a permanent contraction of the anal sphincter which, in cooperation with the likewise pronounced form of the electrode that is intended to match the anal sphincter area of the patient, causes the tightest possible closure of the sphincter adjacent to the electrode neck of the electrode when the impulse is discharged.

Although with the known device a temporary closure of the anus is possible for a predetermined period of time, nevertheless, as a result of the constant stimulation of the anal sphincter there is a risk of the relaxation of the sphincter so that in spite of the pronounced stopper shape of the electrode, it must be accepted that the stopper could abruptly dislodge if the sphincter relaxes.

The problem of the present invention is to create an electrostimulation probe of the type named above that can be adapted to the individual, anatomically determined measurements of a patient and the desired form and intensity of treatment.

This problem is solved through the characterizing features of Claim 1.

The solution according to the invention results in an electrostimulation probe of great efficacy that can be used as a bipolar and multipolar electrode and can be adapted individually to each patient and each form as well as intensity of treatment, without requiring the availability of a number of electrodes.

An advantageous configuration of the solution according to the invention is characterized in that the length of the rod electrode can be changed by pulling out or pushing into the shaft that is the handle of the electrostimulation probe.

Another advantageous configuration of the solution according to the invention is characterized in that the length of the rod electrode can be changed by rotating out or rotating into the shaft that is the handle of the electrostimulation probe.

In both embodiment, the length of the probe of the electrical stimulator can be changed without additional parts so that a change of length can be made at any time and at any location.

In an advantageous improvement of the invention, the shaft has a bore hole to take up the rod electrode while a fastening device stops the rod electrode in a chosen position. The rod electrode can be stopped by means of a clamp screw set into the sleeve area of the shaft or by means of braking elements that produce a frictionally engaged connection between the bore hole of the shaft and the external surface of the part of the rod electrode located in the shaft.

In an advantageous configuration of the solution according to the invention, the fastening device consists of a clamp device that stops the rod electrode in the longitudinal bore hole of the shaft at a selected length of the rod electrode.

For a rod electrode provided with a longitudinal bore hole, the clamp device preferably consists of a clamp element inserted into the longitudinal bore hole of the shaft that has several circularly arranged clamp tongues with a conical internal surface and a partially cylindrical external surface, a clamp cone provided with internal thread, and a pin-shaped tension rod that on one end has thread screwed to the internal thread of the clamp cone and on the other end has a turning handle, and by screwing the tension rod into the clamp cone, the latter is pressed against the conical internal surface of the clamp tongues and these are pressed apart such that the partially cylindrical external surfaces of the clamp tongues press against the wall of the longitudinal bore hole of the rod electrode and thus determine the selected position of the rod electrode.

In this advantageous configuration of the solution according to the invention, the length of the rod electrode can be varied arbitrarily whereby it is simultaneously ensured that, even during sterilization of the electrical stimulation probe, the functional capability of the clamp mechanism is preserved.

In a further advantageous configuration of the solution according to the invention, at the end of the rod electrode, an electrode head is mounted whose external surface preferably is designed in the shape of a keel arch and whose front end consists of a material that doesn't conduct electricity, whereas the rear end of the electrode head that is adjacent to the rod electrode as well as the external surface of the rod electrode consists of a material that does conduct electricity or is provided with an electrically conductive coating.

This configuration of the solution according to the invention ensures that it is possible to protect a patient during treatment and simultaneously to provide a good positioning of the electrostimulation probe in the anal canal of a patient, whereby the flattened rear end of the electrode head is firmly applied to the internal sphincter area of the patient.

Advantageous improvements of the invention are characterized in the subclaims or are represented in more detail in the following, together with the description of the preferred execution of the invention, on the basis of the figures. Shown are:

Figure 1, a longitudinal cross section through the pelvic area of a patient with an electrostimulation probe inserted into the anal area;

Figure 2, a longitudinal cross section through an electrostimulation probe whose length can be changed with screw thread;

Figure 3, a partial section through an electrostimulation probe whose length can be changed with a screw stop;

Figure 4, a longitudinal cross section through a probe for bipolar electrical stimulation whose length can be changed;

Figure 5, a longitudinal cross section through a probe for bipolar electrical stimulation whose length can be changed with a partially conductive electrode head;

Figure 6, a longitudinal cross section through an electrostimulation probe whose length can be changed with a clamp screw fastening;

Figure 7, a longitudinal cross section through an electrostimulation probe whose length can be changed with screw thread as well as braking and stabilizing elements;

Figure 8, a view of a bipolar probe with two ring-shaped conductive coatings and a plug;

Figure 9, a longitudinal cross section through a probe for variable electrical stimulation whose length can be changed with a clamp device to determine the length of the rod electrode, and

Figure 10, an electrostimulation probe with a fastening device according to Figure 9 with an electrode shaped like a keel arch.

The longitudinal cross section through an electrostimulation probe represented in Figure 2 for the treatment of a patient through electrical stimulation of the anal sphincter consists of an electrically insulated, cylindrical electrode shaft 11 that optionally may consist entirely of plastic or the like, or of a metallic electrode with a plastic coating. Connected to electrode shaft 11 is a plate-shaped ring electrode 12 that optionally may consist of a completely electrically conductive material or an electrically conductive coating of titanium or of an insulation material.

Connected to the plate-shaped ring electrode 12 is a cylindrical rod electrode 13 that consists completely or partially of an electrically conductive material.

The upper terminal of the electrode for electrostimulation forms an egg-shaped electrode head 14 that consists in the present embodiment example of an insulation material.

Cylindrical rod electrode 13 has a bore hole 20 to take up an electrical line 30 that may be provided with an insulation casing or consist of an uninsulated line. The electrical line 30 is connected with cylindrical rod electrode 13, such that it conducts electricity, as well as with a receptacle 10 mounted in one end surface 110 of electrode shaft 11.

Cylindrical rod electrode 13 has on its end located in electrode shaft 11 an external thread 50 that can be screwed into a corresponding internal thread of electrode shaft 11. The length of the thread 50 is designed so that at maximum length of cylindrical rod electrode 13, the thread does not project beyond the external surface of the plate-shaped ring electrode 12. The bore hole provided in the plate-shaped ring electrode 12 can also be connected with an electrical spring contact 40 so that a corresponding electrical connection is created between cylindrical rod electrode 13 and the plate-shaped ring electrode 12.

To change the length of the electrically conductive coating of cylindrical rod electrode 13 and thus the electrode surface of the electrostimulation probe represented in Figure 2, with a right thread 50 cylindrical rod electrode 13 is rotated out from electrode shaft 11 or the plate-shaped ring electrode 12 by counter clockwise rotation of the electrode head 14, and is accordingly lengthened. Because the electrical line 30 is designed so that at the greatest possible length of cylindrical rod electrode 13 it is tightly stretched, at shorter lengths of cylindrical rod electrode 13 it forms a loop that has sufficient space in cavity 100 of electrode shaft 11.

Because with normal handling of the electrostimulation probe represented in Figure 2 the electrostimulation probe is only stressed by tension or pressure, fixation of the length of the cylindrical rod electrode 13 in the desired position in each case is normally not required. In addition, however, below the plate-shaped ring electrode 12 in the area of electrode shaft 11, a reverse nut can be attached that enables a securing of the adjusted length in each case of cylindrical rod electrode 13.

Figure 3 shows a longitudinal cross section through an electrostimulation probe with rod electrode 13 whose length can be changed, that is housed sliding in a central bore hole of plate-shaped ring electrode 12 and electrode shaft 11. Cylinder-shaped rod electrode 13 whose length can be changed consists of a material that conducts electricity well, preferably of titanium, and has bore hole 130 against whose wall the spring contacts of electrical contact connector 15 press in a sliding but electrically conductive manner. Contact plug 15 is connected to receptacle 10 into which a plug contact can be inserted that is connected via a line with a stimulation device that discharges an electrical stimulation current pulse. Jack 10 is inserted into base plate 110 that forms the front face of electrode shaft 11.

To fix the position in each case of rod electrode 13, fixation screw 17 is provided, inserted into bore hole 16 of electrode shaft 11, and fixation screw 17 is engaged either through friction on the external surface of rod electrode 13 or in corresponding grooves or bore holes on the external surface of rod electrode 13.

Depending on the application case, plate-shaped electrode 12 is connected in an electrically conductive manner via spring contact 40 with rod electrode 13, or is insulated from rod electrode 13 by a corresponding layer of insulation. In the latter case, the plate-shaped electrode consists of an electrically insulating material.

Rod electrode 13 has either a semispherical or flattened cap on its outer end, or is provided with an egg-shaped electrode head similar to the probe for electoral stimulation according to Figure 2.

Figure 4 shows a longitudinal cross section through a stimulator used optionally as a monopolar or bipolar electrostimulation probe. In this case, rod electrode 13 consists of electrically conductive part 131 and electrically insulating part 132. Line 30 runs into bore hole 130 of rod electrode 13 connects electrically conductive part 131 of rod electrode 13 with receptacle 10 that is set into base plate 110 on the front face end of electrode shaft 11 analogously to the electrostimulation probe according to Figure 3.

Plate-shaped ring electrode 12 is provided with a continuous shaft that reaches all the way to base plate 110. Receptacle 9 is led through base plate 110, that enables electrical contact with plate-shaped ring electrode 12.

Depending on the extended length of cylindrical rod electrode 13, the electrostimulation probe represented in Figure 4 can be used as a monopolar or bipolar electrode. In the form represented, the electrostimulation probe is switched on as a bipolar electrode. If rod electrode 13 is pushed so far into the central bore hole of plate-shaped ring electrode 12 that electrically conductive part 131 of rod electrode 13 comes into contact with the electrically conductive coating of plate-shaped ring electrode 12, a monopolar electrode results and in this case, as a result of spring contact 40, an electrical connection is produced so that the stimulation current impulses are discharged only via line 30. By means of spring-loaded contact pin 133 that is fitted into bore hole 90 in the area of contact jack 4 [sic] at an appropriate position of rod electrode 13, electrical contact with plate-shaped ring electrode 12 is prevented, so that a short-circuit is avoided.

Figure 5 shows a bipolar electrostimulation probe in which rod electrode 13 is partially provided with electrically conductive coating 132 whereas electrically insulating part 132 insulates electrically conductive coating 131 from electrically conductive coating 142 of electrode head 14.

Electrode head 14 may be provided partially or entirely with electrically conductive coating 142; in the embodiment example represented, the upper part of electrode head 14 is designed as electrically insulating part 141.

Plate-shaped ring electrode 12 is also provided with an electrically conductive coating that at least covers the surface of the plate-shaped ring electrode. The electrical contact between the electrically conductive coating 132 of rod electrode 13 and plate-shaped ring electrode 12 is produced via spring contact 40 whereas electrically conductive coating 142 of electrode head 14 is connected with plug contact 10 via line 30.

Plate-shaped ring electrode 12 is connected with second contact jack 9 via line 31 that, just as first contact jack 10, is inserted into base plate 110 at the end of electrode shaft 11.

By pulling out rod electrode 13, the surface of electrically conductive coating 131 can be enlarged. In this manner, the electrostimulation probe can be adapted to different anatomical conditions. Furthermore, the stimulation current strength can be reduced for an enlarged electrically active surface so that, if necessary, protective treatment can be provided.

To stop each length of rod electrode 13, an arbitrary fastening device can be provided. With appropriately strong design of spring contact 40, it is possible to eliminate an additional fastening device if sufficient friction engagement between the bore hole of plate-shaped ring electrode 12 and rod electrode 13 is ensured.

Figure 6 shows a longitudinal cross section through an electrostimulation probe with rod electrode 13, whose length can be changed, which is housed movably in bore holes 111,112 of shaft 11. Adjustable-length, cylindrical rod electrode 13 consists of first part 131 of good electrically conductive material, preferably titanium, and second part 132 which also has good electrical conductivity, but does not have to consist of such high-quality material. This part 132 serves only to adjust the length of rod electrode 13 and has recess 133 whose length corresponds to the total length L of the travel of the rod electrode, which usually is between 10 and 30 mm.

One part 131 of rod electrode 13 is housed in bore hole 111 of shaft 11 whereas a part of second part 132 of rod electrode 13 is housed in bore hole 112. Inset 21 is screwed into an additional front-face bore hole 113 of shaft 11, and takes up a part of second part 132 of rod electrode 13. This part is housed in insulation inset 22 that closes at pin 15 for connection of the rod electrode with a contact jack.

To fix each position of rod electrode 13, fastening screw 17 is provided in bore hole 16 through the wall of shaft 11, which engages in recess 133 of rod electrode 13 through friction.

To adjust the length of rod electrode 13, fastening screw 17 is loosened and the length of rod electrode 13 is altered by extension or retraction into shaft 11. After adjustment of the desired length, fastening screw 17 is tightened and prevents a further change of the length of rod electrode 13, for example, during treatment of a patient.

In the embodiment example represented in Figure 6, the part lying against the external sphincter area during treatment consists of an arched front face 114 of shaft 11. This front face 114 may optionally be provided with a conductive coating, or it may consist of insulation material, depending on the application case of the electrostimulation probe.

Figure 7 shows a longitudinal cross section through an electrostimulation probe whose length can be altered in which the travel L of rod electrode 13 can be adjusted by rotating outwards from shaft 11 or rotating into shaft 11.

Shaft 11 is provided with first bore hole 111 for uptake of the first part 131 of rod electrode 13, which simultaneously forms the part discharging the impulse. In second bore hole 112 of shaft 11, inset 115 is incorporated, which preferably is designed to be metallic and is provided with an internal thread 118. Internal thread 118 serves for uptake of external thread 134 of the second part 132 of rod electrode 13, so that by rotating rod electrode 13 and/or shaft 11 in the direction represented by the arrow, rod electrode 13 can be rotated out of shaft 11 or rotated into the shaft.

The end of rod electrode 13 that is located in shaft 11 is provided with stop screw 117 that projects beyond the edge of second part 132 of rod electrode 13, and stops at stop shoulder 120 in inset 115 when rod electrode 13 is in the end position. In this manner, the alteration of the length of rod electrode 13 is limited and the rotating of rod electrode 13 out of the shaft is prevented.

In addition, inset 115 has connection channel 116 for uptake of a line or a contact pin that closes in connection with contact jack 10 on the front face of shaft 11.

The second part 132 of rod electrode 13 is provided with several thermoplastic pins 119 arranged in a distribution on the circumference, which lie against the internal wall of the bore hole of inset 115 or on external thread 134 and thus stabilize the thread, especially with the rod electrode rotated far outwards. Furthermore, an overly easy rotation movement of the rod electrode is prevented in that the thermoplastic pins brake any rotating movement of rod electrode 13 or shaft 11 and thus stop the adjusted length in each case.

The electrostimulation probe represented in Figure 7 is designed as a monopolar electrode and has conductive coating 18 that encompasses rod electrode 13 and half of electrode head 14.

Figure 8 shows a variable-length electrostimulation probe with egg or olive-shaped electrode head 14 and cylindrical rod electrode 13 that can be sunk into shaft 11 or pulled out from shaft 11.

Rod electrode 13 has two ring-shaped conductive coatings 135,136 between which is provided insulation piece 137. Conductive coatings 135,136 border surface 114 that lies adjacent to probe head 14 or the external sphincter area of the patient, and by changing the length of rod

electrode 13, second conductive coating 136 is lengthened or shortened, or maintains a constant area that connects with another insulation piece that can be sunk into shaft 11.

Surface 114 that lies against the external sphincter area can optionally also be designed to conduct electricity, and may be in contact with second conductive coating 136 or may be designed as an insulated surface. Preferably, surface 114 is designed in the manner of a semicubical parabola or a cissoid and has an enlarged surface that ensures good, solid contact with the external sphincter area of the patient.

To adjust the length of rod electrode 13, a bore hole in shaft 11 is provided with clamp screw 17 by which each adjustment of the electrostimulation probe can be stopped.

In a modification of the representation according to Figure 8, probe head 14 may be partially or completely insulated so that a part of the surface of probe head 14 contributes to the conveyance of the stimulation impulse.

Figure 8 shows schematically of the connection of conductive coatings 135,136 with jack plug 5 which can be plugged into shaft 11, that has two contact areas 51,52 which make the connection with conductive coatings 135,136 corresponding to the schematic representation according to Figure 8. The contact pin of jack plug 5 is grounded up to contact surfaces 51,52.

Jack plug 5 is inserted into electrode shaft 11 up to the stop on plug handle 53, and makes the electrical connection via alligator clips 54,55 with terminals of a stimulation device.

In Figures 9 and 10, an electrostimulation probe is represented in a longitudinal cross section in which the fastening device is provided to determine the selected length of the part of the rod electrode is provided as a clamp device.

This clamp device consists of clamp element 45 inserted into longitudinal bore hole 111 of shaft 11, which has ring-shaped base 451 and several clamp tongues projecting from this ring-shaped base 451 that are provided with a partially cylindrical external surface and on the opposite end, a conical internal surface 450. Preferably four clamp tongues are provided between which a longitudinal cleft is arranged so that the ends of the clamp tongues can move outwards to change the external diameter of the clamp element.

Rod electrode 13 is provided with longitudinal bore hole 138 whose diameter is slightly greater than clamp cone 46 that has a conical terminal surface which can be inserted into the conical internal surface of the clamp tongues of clamp element 45. A tension rod screwed with internal thread of clamp cone 46 has threaded end 44 that can be screwed with the internal thread of clamp cone 46.

On the other end of tension rod 43, the latter is provided with metallic inset 42 that has graduated bore hole 10 for uptake of a contact connector. On this end, tension rod 43 is provided with a handle whose external surface is essentially matched to the external surface of electrode shaft 11. The external surface of handle 41 has several flattened areas and/or longitudinal

grooves that improve the grip of handle 41 so that it can easily be rotated. Handle 41 connects with the end of shaft 11 and consists of a material that does not conduct electricity.

By screwing tension rod 43 into clamp cone 46, the latter is drawn in the direction of the end of shaft 11, and with its conical terminal area presses the conical internal surface of the clamp tongues of clamp element 45 apart so that the partially cylindrical external surfaces of the clamp tongues of clamp element 45 rest firmly on the internal surfaces of longitudinal bore hole 138 with rod electrode 13, and thus rod electrode 13 is stopped in the desired position.

By rotating handle 41 in the opposite direction, clamp cone 46 is pushed in the direction of electrode head 14 so that the external diameter of clamp element 45 is reduced due to the elastic arrangement of the clamp tongues, and thus, the friction-type locking between clamp element 45 and the internal surface of longitudinal bore hole 138 of rod electrode 13 is reduced so that rod electrode 13 can be pushed into longitudinal bore hole 111 of shaft 11.

With renewed rotation of handle 41 again in the opposite direction, clamp cone 46 is again drawn into the conical internal surface of clamp element 45 so that the external surface of the clamp tongues lies in friction-type locking against the wall of longitudinal bore hole 138 of rod electrode 13 and thus stops rod electrode 13 in the adjusted position.

O-ring 47 set into longitudinal bore hole 111 of electrode shaft 11 in the area of the insertion opening for rod electrode 13 serves to seal the clamp device so that its functional capability is ensured even after prolonged use of the electrostimulation probe.

Length L 1 of rod electrode 13 is preferably between 5 and 30 mm, depending on the length it is extended, whereas length L 2 of electrode shaft 11 is ca. 65 mm including the handle.

Electrode head 14 has a diameter of 17 mm, 22 mm, or 27 mm, depending on the embodiment. Naturally, these are only suggested values which can be modified as needed, for example, to produce special models.

Figure 9 shows egg-shaped electrode head 14 whose front terminal surface does not conduct electricity, whereas surface 18 adjacent to rod electrode 13 conducts electricity or is provided with an electrically conductive coating. Preferably, rod electrode 13 also consists of an electrically conductive material or the rod electrode is provided with an electrically conductive coating.

In Figure 10 the same electrostimulation probe is represented as that in Figure 9, except that it has electrode head 14 in the shape of a keel arch, that has an end tapering to a point and a flattened base. This form of the electrode head is characterized by an especially good positioning of the part of the electrostimulation probe that is inserted into the anal area of a patient, so that electrically conductive part 18 of electrode head 14 which transmits the treatment impulses ensures good transmission of the impulses to the internal sphincter area of the patient as well as a

secure positioning, whereas rod electrode 13 consisting of electrically conductive material ensures good transmission of the impulse in the anal canal of the patient.

The invention is not limited in its execution to the preferred embodiment example given above. Rather, a number of variants are conceivable which make use of the represented solution even through fundamentally different executions.

Claims

1. Electrostimulation probe to treat bladder or anal incontinence as well as hemorrhoids, with a rod electrode that can be inserted into the anal canal of a patient, a part that limits the penetration depth and rests on the external sphincter area, and a shaft for handling the probe, whereby the rod electrode is designed at least partially as an electrically conductive electrode, characterized in that the rod electrode (13) has a variable length (L_1).

2. Electrostimulation probe according to Claim 1, characterized in that the length of the rod electrode (13) can be changed by pulling it out or pushing it into the shaft (11).

3. Electrostimulation probe according to Claim 1, characterized in that the length of the rod electrode (13) can be changed by rotating it out or rotating it into the shaft (11).

4. Electrostimulation probe according to Claim 1 or 2, characterized in that the shaft (11) has a longitudinal bore hole to take up the rod electrode (13) and that a fastening device (17; 41-45) stops the rod electrode (13) in a selected position.

5. Electrostimulation probe according to Claim 4, characterized in that the fastening device consists of a clamp device (41-45) that stops the rod electrode (13) in the longitudinal bore hole (111) of the shaft (11) in a selected length of the rod electrode (13).

6. Clamp device according to Claim 5, characterized in that the rod electrode (13) has a longitudinal bore hole (138) and that the clamp device consists of a clamp element (45) inserted into the longitudinal bore hole (111) of the shaft (11) that has several circularly arranged clamp tongues (45) with a conical an internal surface and a partially cylindrical external surface, a clamp cone (46) provided with an internal a thread, and a pin-shaped tension rod (42,43) that has on one end thread (44) screwed to the internal thread of the clamp cone (46), and on the other end a rotating handle (41), and by screwing the tension rod (22,43) into the clamp cone (46), the latter is pressed against the conical internal surface of the clamp tongues (45) and presses them apart such that the partially cylindrical external surfaces of the clamp tongues (45) press against the wall of the longitudinal bore hole (138) of the rod electrode (13) and thus fix the selected position of the rod electrode (13).

7. Electrostimulation probe according to Claim 6, characterized in that the handle (41) is designed essentially as a continuation of the shaft (11), and its external diameter corresponds at

least partially to the external diameter of the shaft (11) and the external surface of the handle (41) has several flattened areas and/or longitudinal grooves to improve the grip of the handle (41).

8. Electrostimulation probe according to Claim 6 or 7, characterized in that an O-ring (47) is inserted into the longitudinal bore hole (111) of the shaft (11) directly behind the insertion opening for the rod electrode (13), and rests against the external surface of the rod electrode (13).

9. Electrostimulation probe according to Claim 4, characterized in that the fastening device consists of a clamp screw (17) running through a bore hole (16) in the sleeve surface of the shaft (11), which rests against the external surface of the rod electrode (13) to stop the length of the rod electrode (13).

10. Electrostimulation probe according to Claim 3, characterized in that a portion of the part of the rod electrode (13) located in the shaft (11) is provided with an external thread (134), and the shaft (11) has the same type of internal thread (118).

11. Electrostimulation probe according to Claim 10, characterized in that the part (132) of the rod electrode (13) located in the shaft (11) is provided with a plastic coating.

12. Electrostimulation probe according to Claim 11, characterized in that the plastic coating consists of thermoplastic pins (119).

13. Electrostimulation probe according to one of the preceding Claims 10-12, characterized in that an inset (115) is inserted into the bore hole of the shaft (11) with an internal thread (118) for uptake of the part (132) of the rod electrode (13) provided with an external thread (134).

14. Electrostimulation probe according to Claim 13, characterized in that the end of the rod electrode (13) has a stop element (117) and the inset (115) has a stop shoulder (120) to limit the extension of the rod electrode (13).

15. Electrostimulation probe according to one of the preceding claims, characterized in that the part of the rod electrode (13) that can be sunk into the shaft (11) is designed as part of a mono- or bipolar electrode such that the surface of the rod electrode (13) to be used for active stimulation can be altered.

16. Electrostimulation probe according to one of the preceding claims, characterized in that a spherical or egg-shaped head (14) is mounted on the end of the rod electrode (13) which optionally may be provided with an electrically conductive coating to form an electrode.

17. Electrostimulation probe according to Claim 16, characterized in that the forward end of the electrode head (14) consists of a material that does not conduct electricity, and the rear end as well as the external surface of the rod electrode (13) consists of a material that does conducts electricity or is provided with an electrically conductive coating (18).

18. Electrostimulation probe according to Claim 17, characterized in that the electrode head (14) is designed in the shape of a keel arch.

19. Electrostimulation probe according to one of the preceding claims, characterized in that on the front face (110) of the shaft (11) an electrical plug connection (9; 10) is provided that preferably is designed as a single- or multiple-pole coaxial plug.

20. Electrostimulation probe according to one of the preceding claims, characterized in that an electrical line or electrical lines (30,31) connects the plug connection (9,10) with the electrode or electrodes (12,13,14), and an additional space is provided in the shaft (11) to take up the electrical line or lines (30,31).

21. Electrostimulation probe according to one of the preceding claims, characterized in that a spring contact (15) connects the electrical plug connection (10) with the electrode or electrodes (12,13,14).

22. Electrostimulation probe according to Claim 4, characterized in that the rod electrode (13) is provided with recesses in its area that can be retracted in which a detent engages that can be operated by a fastening element that is mounted on the circumference of the shaft (11).

23. Electrostimulation probe according to one of the preceding claims, characterized in that the part resting against the external sphincter area of a patient consists of a ring electrode (12) that is at least partially provided with an electrically conductive coating and that an electrically conductive spring contact (40) is provided between the bore hole of the ring electrode (12) and the rod electrode (13).

24. Electrostimulation probe according to one of the preceding claims, characterized in that the part (12) resting against the external sphincter area of a patient has a surface that does not conduct electricity.

25. Electrostimulation probe according to Claim 23 or 24, characterized in that the part (12) resting against the external sphincter area of a patient has a surface with the longitudinal cross section of a semicubical parabola or a cissoid, and the surface (114) is optionally provided with a coating that conducts electricity or consists of an insulation material.

26. Electrostimulation probe according to one of the preceding claims, characterized in that the rod electrode (13) and/or the part (12) resting against the external sphincter area is designed in the shape of a circle or ellipse in cross section.

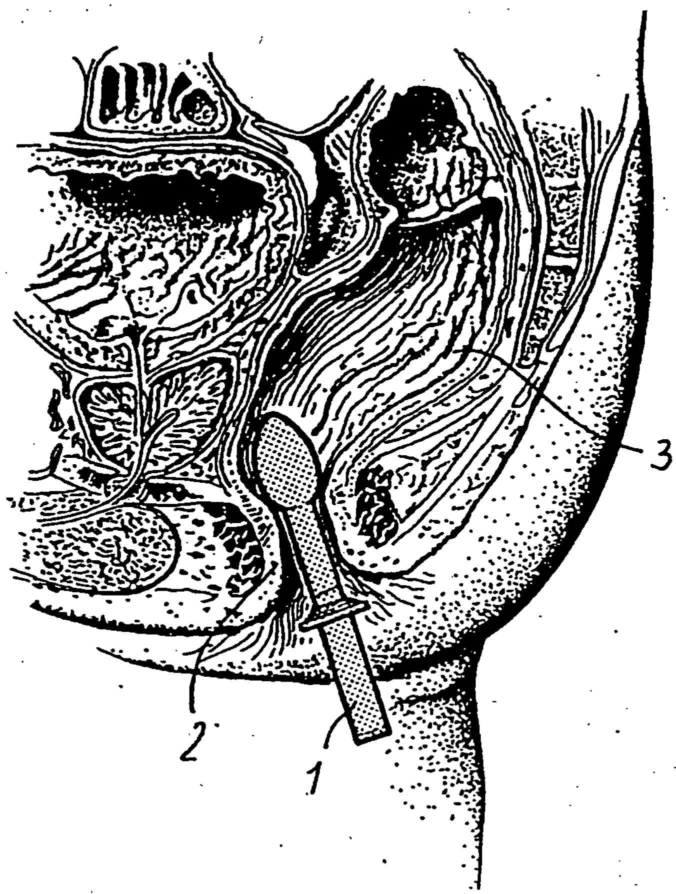


Figure 1

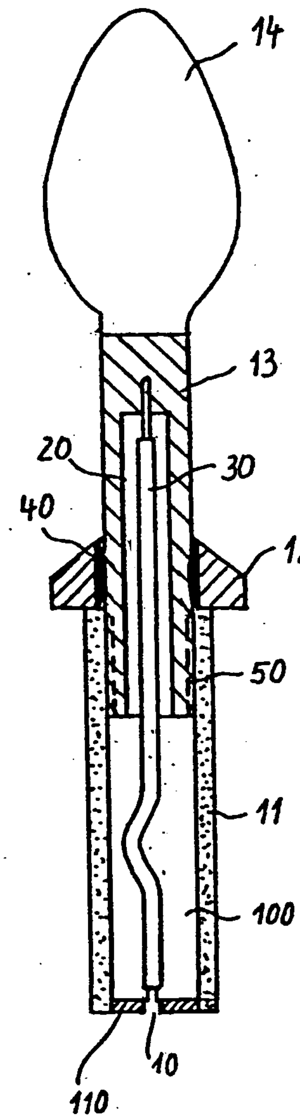


Figure 2

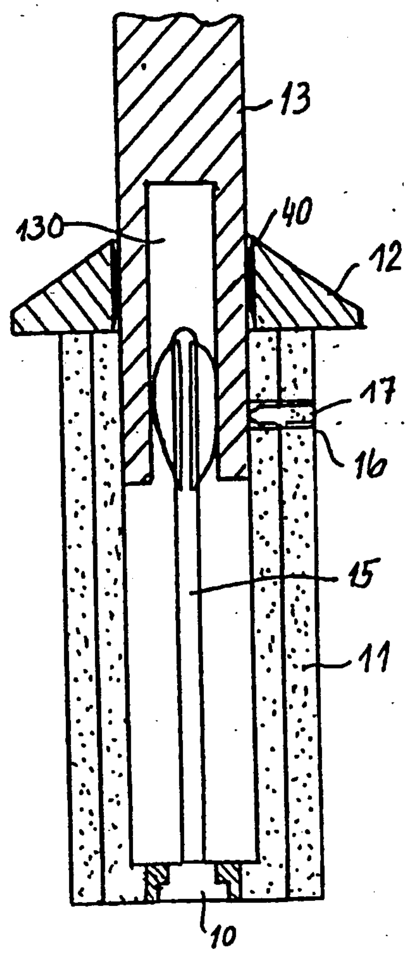


Figure 3

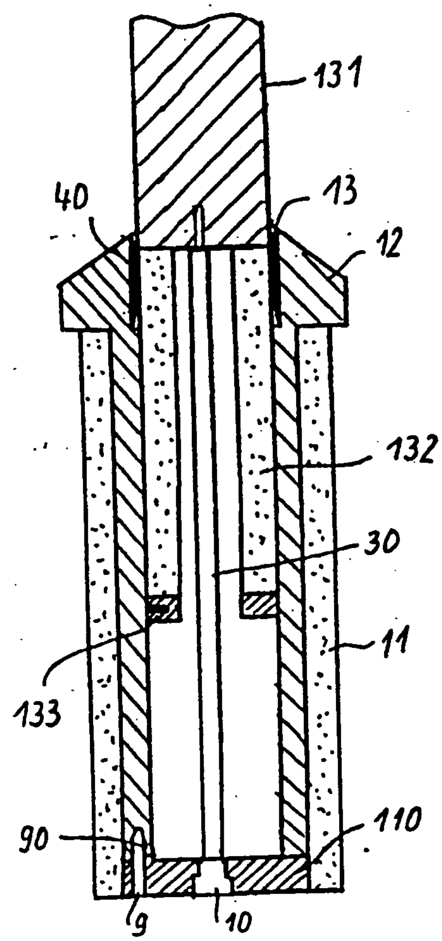


Figure 4

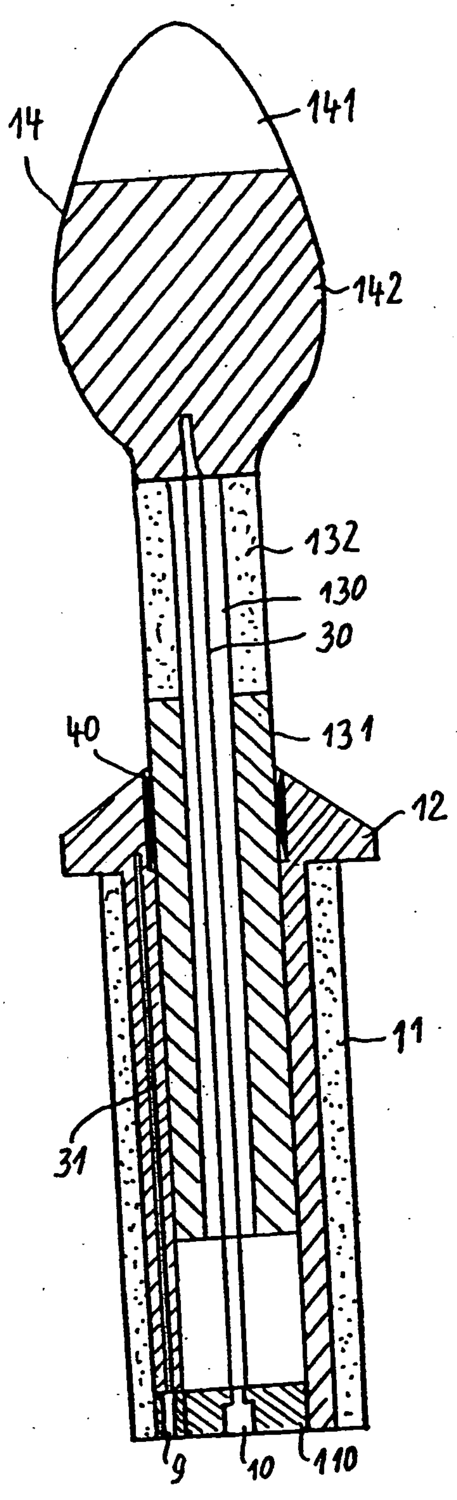


Figure 5

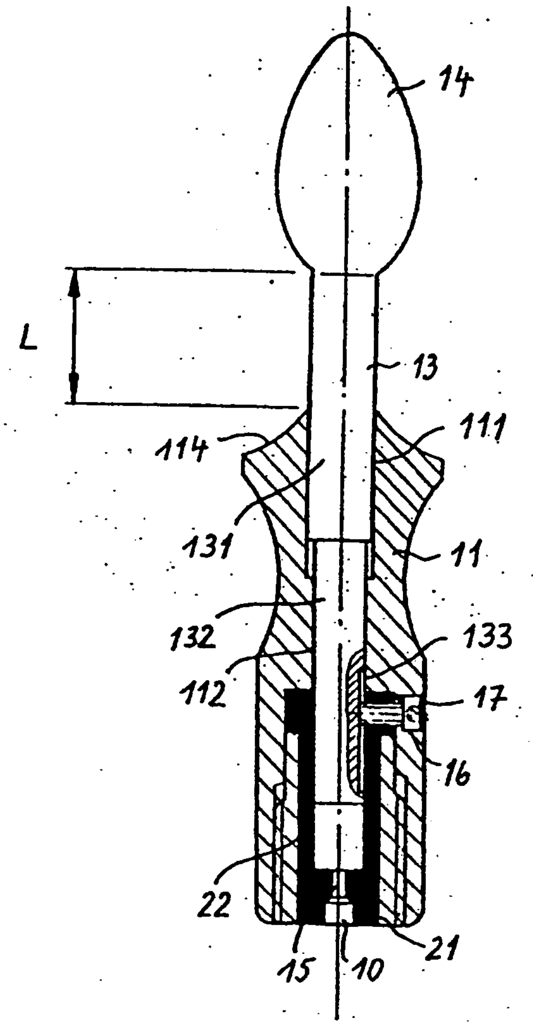


Figure 6

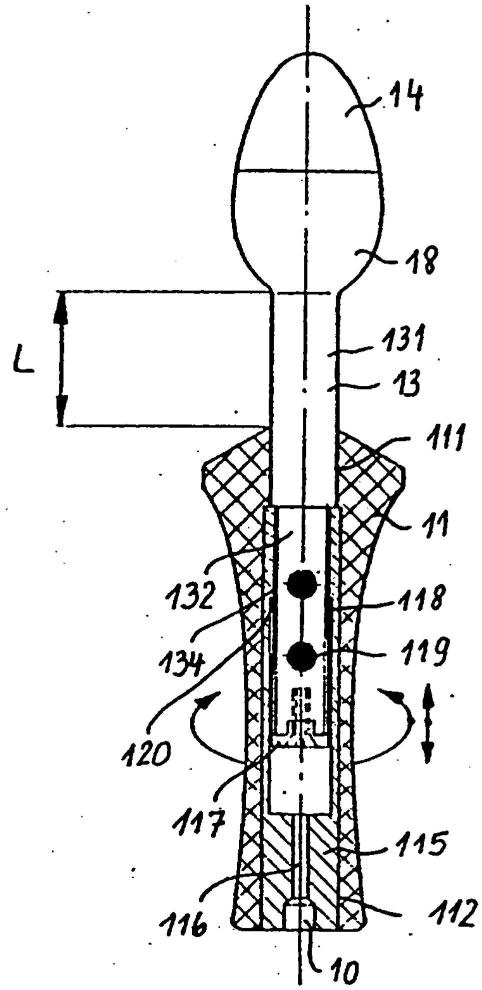


Figure 7

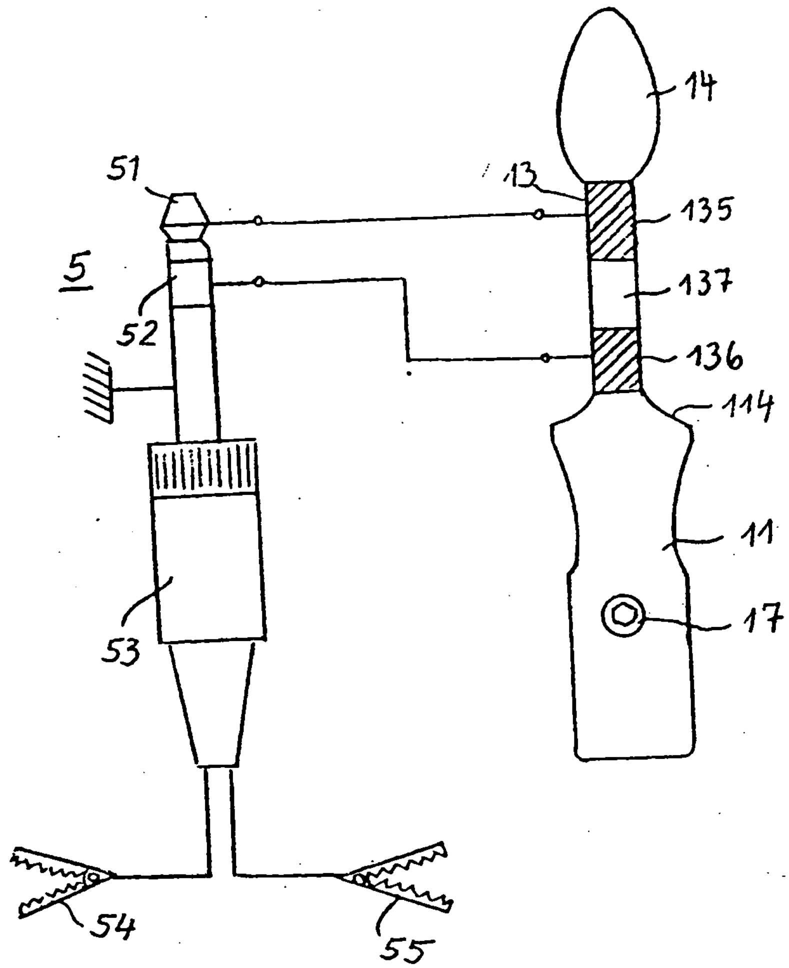


Figure 8

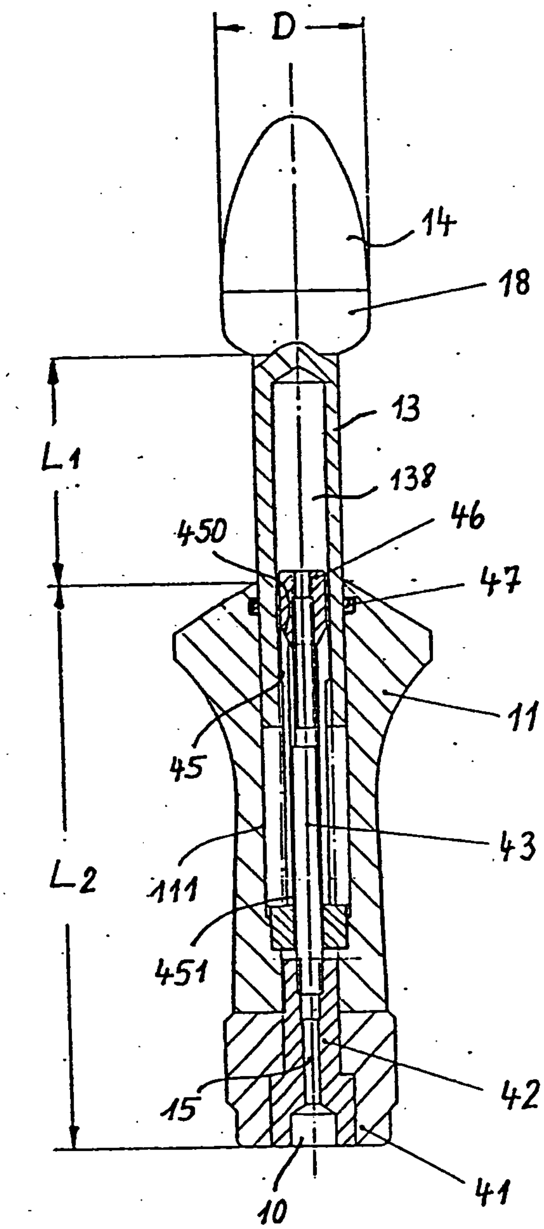


Figure 9

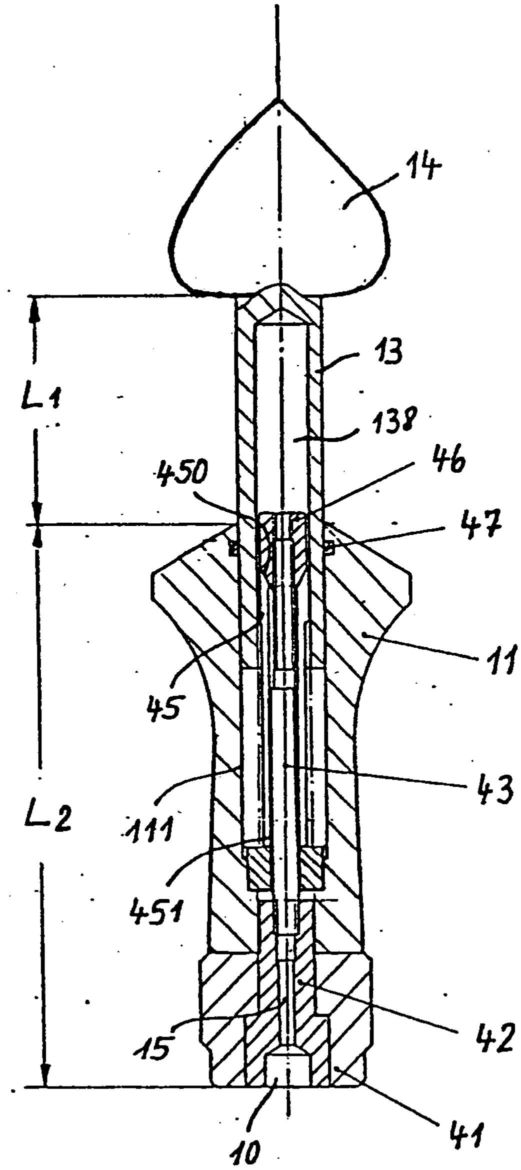


Figure 10